INSTITUTE OF PUBLIC HEALTH

COLLEGE OF MEDICINE AND HEALTH SCIENCES

UNIVERSITY OF GONDAR

PREVALENCE OF MENTAL DISTRESS AND ASSOCIATED FACTORS AMONG UNDERGRADUATE STUDENTS OF UNIVERSITY OF GONDAR, NORTHWEST ETHIOPIA.

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List of Acronyms

CHMS	College of Medicine and Health Sciences
DALYs	Disability Adjusted Life Years
HPA	Hypothalamic Pituitary- Adrenocortical
IEC	Information, Education and Communication
PHCTC	Public Health College and Training Centre
SPSS	Statistical Package for Social Sciences
SRQ	Self Reporting Questionnaire
SRQ-E	Self Reporting Questionnaire for Ethiopian population
UoG	University of Gondar
USA	United States of America
WHO	World Health Organization

Table of contents

List of figures

List of tables

List of Annexes

Abstract

Background: Although mental health problems affect society as a whole and no group is immune to mental disorders; today in ultra competitive environment students have significantly high level of mental distress than their community peers.

Objectives: The purpose of this study was to assess the prevalence and associated factors of mental distress among undergraduate students of University of Gondar, Northwest Ethiopia.

Methods: Institution based cross sectional study was conducted among 836 students from April 9-11/2014. Stratified random sampling technique was used to select the study participants. Data were collected using pretested and structured self-administered questionnaire. Bivariate and multivariate logistic regression model was fitted to identify factors associated with mental distress among students. An adjusted odds ratio with 95% confidence interval was computed to determine the level of significance.

Results: Prevalence of mental distress among students was found to be 40.9%. Female sex (AOR=1.65; 95% CI 1.17-2.30), lack of interest towards their field of study (AOR=2.28; 95% CI 1.49-3.50), not having close friends (AOR=1.48; 95% CI 1.03-2.14), never attend religious programs (AOR=1.58; 95% CI 1.02-2.46), conflict with friends (AOR=1.93; 95% CI 1.41-2.65), having financial distress (AOR1.49= 95% CI 1.05, 2.10), family history of mental illness (AOR=2.12; 95% CI 1.31-3.45), Ever use of Khat (AOR=1.71; 95% CI 1.12-2.59), decrease grade than anticipated(AOR=2.07; 95% CI 1.51-2.83), lack of vacation or break (AOR=1.46; 95% CI 1.06-2.02) , low social support(AOR=2.58; 95% CI 1.58-4.22) and moderate social support(AOR= 2.50;95% CI 1.54-4.04) were significantly associated with mental distress.

Conclusion: The overall prevalence of mental distress among students was found to be high. Being female sex , lack of interest towards the field of study, not having close friends, never attend religious programs, conflict with friends, having financial distress, family history of mental illness, ever use of Khat, lower grade than anticipated, lack of vacation or break, and low to moderate social support were factors associated with mental distress.

Keywords: Mental distress, Students, University of Gondar

1. Introduction

1.1. Statement of the problem

Mental distress is a mental health problem characterized by symptoms such as insomnia, fatigue, irritability, forgetfulness, difficulty in concentrating and somatic components. It includes depression, anxiety and somatic symptoms such as sleep problems, headache and backache [1-4].

Currently mental distress is an important public health problem. About 450 million people suffer from mental distress in the world today [5, 6] and it is a leading cause of disability worldwide, accounting for one third of disability adjusted life years (DALYs) [7, 8].

In Africa mental illness is an important public health challenge that is under recognized as a public burden. Studies conducted in South Africa revealed that the prevalence of common mental disorders is 27% [9]. In Ethiopia mental disorders account for 11% of total burden of diseases [10].

Although mental health problems affect society as a whole and no group is immune to mental disorders; today in ultra competitive environment students have significantly high level of psychological distress than their community peers [11-13]. A study among undergraduate students in Canada showed that 30% of students had psychological distresses which was significantly higher than that of adults in the general population of Canada [14] .

University students face multiple stressors such as academic load, constant pressure to succeed, competition with peers, financial burden, peer, teacher or parental pressure as well as concerns about the future [15, 16]. This can have negative effects on student's ability to study and academic outcomes [13, 17, 18]. Such situation of stress may later lead to mental health problems but students seldom seek help for their problems [19-21].

Mental distress among university students is of an increasing concern [22]. More than half of students in USA [23], 53% of students in Australia [24], 41.9% of students in Malaysia [25], 10.8% of students in Kenya [26] and 21.6% of students in Ethiopia [27] experienced mental distress. However, Only 1.4% of distressed students received mental health care [28].

While these facts remain about mental distress and their contribution to the global burden of diseases, the attention given to mental health is very low across the globe in general and for university students in particular. This is even more so in low-income countries like Ethiopia [29].

Undergraduate students need to cope not only with psychological and psychosocial changes that are connected to the development of an autonomous personal life but also with the academic and social demands that they encounter in university studies in their preparation for professional careers [15, 16]. Hence, the period of undergraduate education is a sensitive period in an individual's life span, and this period is therefore an important for developing systems and intervention methods that may prevent or reduce mental problems.

Therefore, this study was aimed to determine the prevalence of mental distress and identify associated factors among students in University of Gondar, Northwest; Ethiopia.

1.2. Literature review

1.2.1. Prevalence of mental distress among University students

Mental distress among university students is of an increasing concern [22]. Nowadays the number of students with serious psychological problems on campus has increased [30].

More than half of university students in USA [23] , 41.9% of students in Malaysia [25], 44.7% students in Brazil [31], 25.7% students in France [32] , 22.9% students in Norway [33], and 22.5% students in Iceland [28] and 19.2% of university students in Australia [13] experienced mental distress.

In Africa mental illness is an important public health challenge that is under recognized as a public burden. Studies revealed that prevalence of mental distress among university students was about 27% in South Africa [9] , 16.2% in Uganda [34] and 10.8% in Kenya [26].

In Ethiopia mental disorders account for 11% of total burden of diseases [10]. Although researches done on mental distress were limited; a prevalence of 21.6% and 49.1% were reported among university students in Ethiopia [27, 35].

1.2.2. Factors associated with mental distress in students

There is no known single causative agent for mental distress. Various factors were reported to be associated with mental distress among university students. Studies revealed that mental distress is significantly higher in female than male students [12, 13, 17, 22, 33, 36] . In addition to sex, age was found to be another socio-demographic factor associated with mental distress in students. Different studies demonstrated that young age (age $\leq$19 years) tend to be associated with higher rates of mental distress [11, 13, 37].

Mental distress in students is also often associated with substance use like Khat, cigarette smoking, alcohol and drug misuse. Thus, those students who use substance like khat were more likely to have mental distress than those who do not [27, 31, 38].

Other studies done in Australia [13], Norway [33] and Ethiopia [35] identified that freshman (first year) students were more likely to have mental distress than second year and above. Difficulty in making friends and poor academic performance were other factors positively associated with mental distress in students [31].

According to a study done in Australia, United States of America and Nigeria; financial distress was the most significant determinant of mental distress in University students. Those who have financial problem were more likely to have mental distress as compared to students who have not financial distress [13, 39, 40].

Social support was also another factor associated with mental distress. Having high level of emotional support from close ones (partner, mother, father, best friends and significant others (religious leaders and health professionals) were negatively associated with mental distress. On the other hand, those students who have no social support or separated from pre-existing social support were more likely to have mental distress [31, 34, 41].

Family history of mental illness [27], frequent conflict with fellows [27, 35], frustration with academic challenges [42], overcrowding and congested class rooms [40] were additional factors positively associated with mental distress. Whereas being second year in enrollment and attending religious program regularly [27, 35] were negatively associated with mental distress in students.

1.3. Conceptual framework

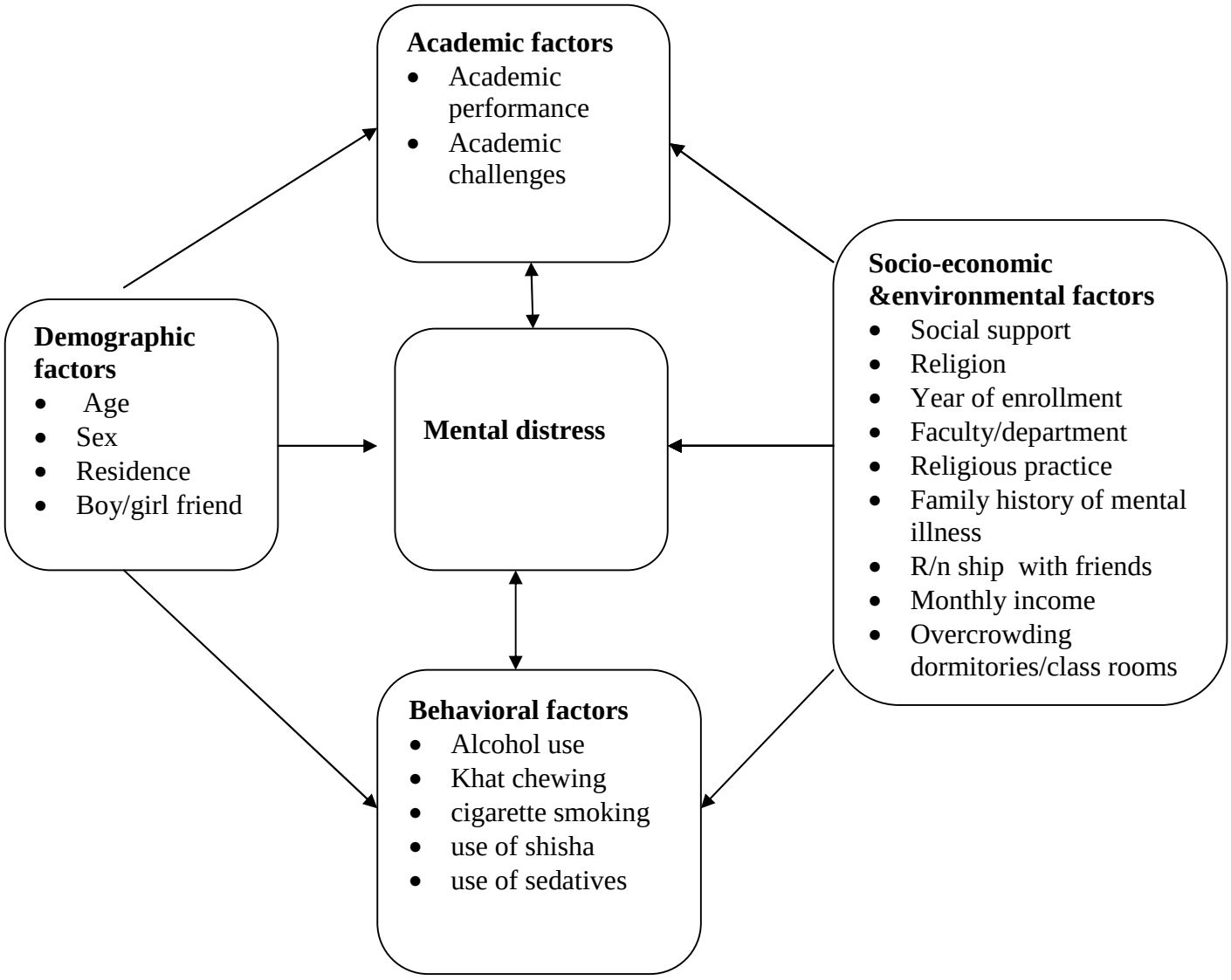

Figure 1: Conceptual framework on prevalence of mental distress and associated factors among students of UOG, Northwest Ethiopia, 2014. [Source: Prepared by the investigator after thorough searching of literatures]

1.4. Justification of the study

Mental distress is becoming a common health problem among University students. Although there are few studies indicating mental health status of the population in Ethiopia, data on mental health among University students are still scarce. Even if mental problem was included in the national health policy of Ethiopia, interventions against the problem are very limited and lack of information about the problem is a contributory factor for poor mental health services [2, 43]. Hence, accurate epidemiological information is necessary to understand the burden of mental health problems in students, to guide interventions that decrease risk and improve student's psychological wellbeing and to monitor trends over time. Therefore, this study determines the prevalence of mental distress and the associated factors among students. Results from this study will help in developing evidence based mental health promotion and disease prevention programs.

2. Objectives

2.1. General objective

To assess prevalence of mental distress and associated factors among undergraduate students of University of Gondar, Northwest Ethiopia.

2.2. Specific objectives

- To determine the prevalence of mental distress among undergraduate students at University of Gondar.
- To identify factors associated with mental distress among undergraduate students at University of Gondar.

3. Methods

3.1. Study design and period

Institution based cross sectional study was used to determine the prevalence of mental distress and associated factors among University of Gondar undergraduate students from April 9-11/ 2014.

3.2. Study area

The study was conducted in University of Gondar, which is located 748 KM away from Addis Ababa, the capital city of Ethiopia, to the Northwest direction. University of Gondar (UoG) which is located in historical town of Gondar was officially established with its current status and autonomy in 2004. In 1954 the University was initially established as Public Health College and Training Centre (PHCTC) now known as College of Medicine and Health Sciences (CMHS). At present the University consists of 4 colleges, 2 faculties and 3 schools. There are about 61 postgraduate and 55 undergraduate programmes in the University. Currently there are around 3686 administrative staffs, 1449 academic staffs, 15,723 regular undergraduate students and about 1,452 postgraduate students in the University.

3.3. Source and study population

3.3.1. Source population: All regular undergraduate students in University of Gondar were the source population

3.3.2. Study population: All regular undergraduate students in University of Gondar who were available during study period were the study population.

3.4. Sample size determination and sampling procedure

3.4.1. Sample size determination

Sample size was determined by single population proportion formula using EPI INFO stat calc program with the assumption of population size 15,723, 95% level

of confidence, 4% of marginal error, and taking prevalence of mental distress 21.6 % [27]. To determine sample size key factors like substance use, gender, family history of mental illness and religious practice [27, 28] were also considered and the one which gives the highest sample size was used.

Here is the computation;

Variables	**Assumptions**	**Sample size**
Mental distress	21.6 (Prevalence)	396
Substance use (Khat)	OR=2.23, P= 26.4, Power=80%, CI =95%	350
Female sex	OR=2.4, P= 22.5, Power=80%, CI =95%	350
Family history of mental illness	OR=2.3, P= 32.5, Power=80%, CI =95%	278
Religious practice (No)	OR=32.7, P= 97.7, Power=80%, CI =95%	40

Therefore; prevalence of mental distress was used for sample size calculation since it gave maximum figure which can address all study objectives. With these assumptions, the resulting sample size becomes **396**. Taking in to account the design effect of two, the minimum sample size required became **792.** Considering 10% non response rate, the final sample size became 872.

3.4.2. Sampling procedure

Stratified multistage sampling technique was used to select departments in each college/faculty /school; with the assumption of difference in level of mental distress across college/faculty/ school. Thus; out of 57 departments in the University 15 were selected randomly. Proportional allocation is used to maintain proportionality among college /faculty/schools and then study participants from each department were further selected using simple random sampling technique (Figure 2).

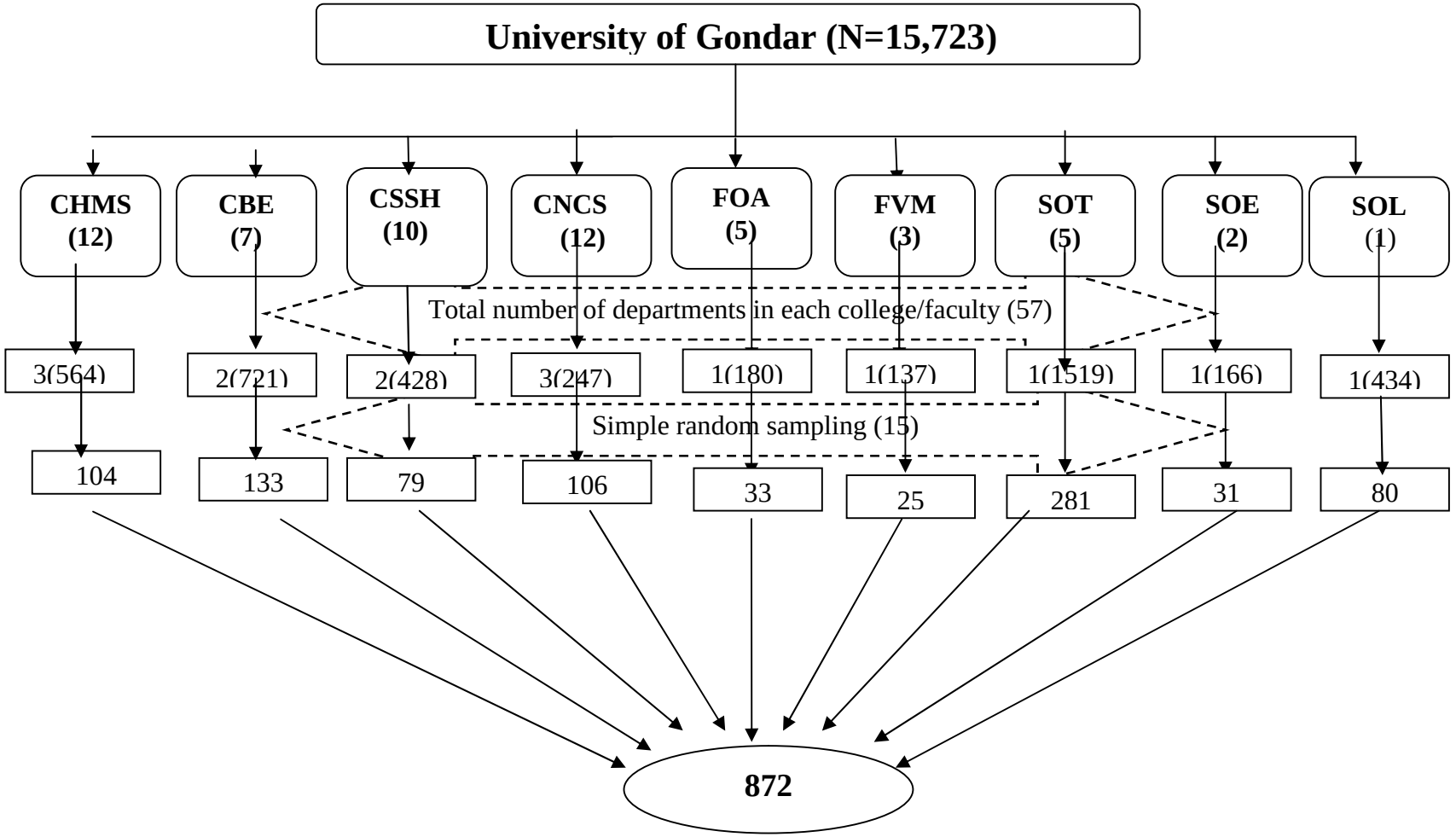

Figure-2: Schematic presentation of the sampling procedure to select the study participants

Key: **CMHS:** College of Medicine and Health sciences, **CBE:** College of Business and Economics, **CNCS**: College of Natural and Computational Sciences, **CSSH:** college of Social science and Humanities, **FVM:** Faculty of Veterinary Medicine, **FOA:** Faculty of Agriculture, **SOT:** School of Technology, **SOE:** School of Education, **SOL:** School of Law.

3.5. Inclusion and exclusion criteria

3.5.1. Inclusion criteria: All regular undergraduate students of the University of Gondar were included in the study.

3.5.2. Exclusion criteria: Those students who are seriously ill to communicate during the data collection were excluded from the study.

3.6. Variables of the study

3.6.1. Dependant variable

- Mental distress (Yes/No)

3.6.2. Independent variables

- **Demographic characteristics:** age, sex, having boy/girl friend , and residence
- **Socioeconomic and environmental factors**: social support, religion, monthly income, family history of mental illness, relationship with friends, religious practice, year of enrollment, faculty/department, overcrowding class rooms and/or dormitories.
- **Behavioral factors:** alcohol consumption, khat chewing, cigarette smoking, use of Shisha, and sedatives (for non-medical purpose).
- **Academic factors:** academic performance and frustration with academic challenges.

3.7. Operational definition

Mental distress: In this study, students who were found to have 8 or more symptoms of the 20 items self reporting questionnaires (SRQ-20) in the last 4 weeks were considered as having mental distress. The cut point was used based on the reports from the validation study of SRQ-20. The cut-off point was thus chosen as the SRQ-E score that gave the highest sensitivity and specificity which corresponds to a cut-off point of 8. In Ethiopia, sensitivity and specificity of the instrument is 86% and 84% respectively for cut point of 8 [44].

Substance use (khat /Catha Edulis, Alcohol, Cigarette, Shisha and sedatives)

- **Current users:** when subjects use specified substance at least once in the last one month.
- **Ever users:** when subjects used specified substance at least once in their life time.

Social support: it was measured using 12-item Multidimensional Scale of Perceived Social Support [45].

- **High level of social support:** when subjects score 69-84 of the sum of social support scale.
- **Moderate social support:** when subjects score 49-68 of the sum of social support scale.
- **Low level of social support:** when subjects score 12-48 of the sum of social support scale.

3.8. Data collection tools and procedures

Data were collected using structured self administered questionnaire having five parts. The first part contains socio-demographic characteristics of students. The second part of the questionnaire is a Self Reporting Questionnaire. In this study self reporting questionnaire was used to estimate the prevalence of mental distress in students. This self reporting questionnaire (referred to as the SRQ-20) is a standardized questionnaire having 20 item questions, originally developed by World Health Organization (WHO) designed to indicate mental distress [46]. The tool is adopted from WHO and was validated in low and middle income countries including Ethiopia [44, 47]. Third part of the questionnaire is asking about behavioral factors, which includes history of substance use (like Alcohol use, Khat chewing, cigarette smoking, Shisha and sedative use) of students. The forth part of the questionnaire is assessing about academic factors and the last part of the questionnaire is assessing about social support using 12-item Multidimensional Scale of Perceived Social Support Tool [45]. The items are divided in to factor groups relating to the source of social support namely family, friends and significant others. Each item is scored from one (Very strongly

disagree) to 7 (very strongly agree). The total sum of all the 12 items possibly ranges from 12 to 84. The reliability of the tool was checked using Cronbach's alpha reliability test with a score of 0.82 (95% CI 0.801-0.837).

One MSc in mental health supervisor and nine nurse professional facilitators were employed and trained for half a day about the purpose of the study, timely collection of data and overall data collection procedure. English version questionnaire was used to collect the data.

3.9. Data quality control

To assure the quality of the data the questionnaire was pre-tested 1 week before the actual data collection time on 50 undergraduate students at Debretabour University and appropriate modification was made. Training was given for the supervisor and the facilitators. During the course of the data collection, facilitators were supervised at each site. The collected data were reviewed and checked for completeness before data entry and incomplete data were discarded.

3.10. Data processing and analysis

Data clean up and cross-checking was done before analysis. Data were checked, coded and entered to EPI INFO version 7 then it was exported to SPSS version 20 for analysis. Both descriptive and analytical statistical procedures were utilized. Descriptive statistics like percentage mean and standard deviation were used for the presentation of demographic data and prevalence of mental distress. Tables were also be used for data presentation.

Binary logistic regression was used to identify factors associated with mental distress among the students. Multiple logistic regression model was fitted to control the possible effect of confounders and finally the variables which had independent association with mental distress were identified on the basis of OR, with 95%CI and p-value less than 0.05. The variables were entered to the multivariate model using the Backward Stepwise regression method. Model fitness was checked using Hosmer and Lemeshow goodness of a fit test (P= 0.77).

4. Ethical considerations

Ethical clearance was obtained from Ethical review committee of Institute of public health, University of Gondar. Permission to conduct the research was obtained from each college/ faculty/schools. Informed consent was obtained from respondents who were selected to participate in the study after explaining the purpose of the study.

To ensure confidentiality their name and other personal identification were not registered in the format**.** It had been explained to the participants that the selection to the study was random. It was also explained to the participants that they have the right to not participate in the study or discontinued at any time. It was also told that there was no risk or punishment for the student who was not voluntary to participate in the study. Finally, the questionnaires were kept locked after data entry had been completed.

5. Results

5.1. Socio demographic characteristics of the respondents

Out of 872 study participants, 836 students were participated in the study giving response rate of 95.87%. The reasons for the 36 (4.13 %) individuals who were not included on the study were: 25 (2.87%) questionnaires found to be incomplete and excluded and the rest 11(1.26%) study subjects were not volunteer to participate in the study.

Most 538 (64.4%) respondents were male. The mean (standard deviation) age of the respondents was 20 (±1.54) years. The higher percentages of the respondents were from urban background 544 (65.1%). About three forth of the respondents 618 (73.9%) were followers of Orthodox Christianity and majority of the respondents 714 (85.5%) take part in religious practice.

Greater part of the respondents were from faculty of technology 270 (32.3%) and more than one third of the respondents 286 (34.2%) were first year in academic enrollment. Out of the total respondents 675(80.7%) joined the department by their choice and most 706 (84.4%) were currently interested in their felid of study. More than half of the respondent's 497 (59.4%) do not have boy or girl friend. Moreover, most 540 (64.6%) of the respondents do not have close friends. Five hundred twenty one (62.3%) of the respondents had pocket money ranging from minimum of 50 to maximum of 2000 Ethiopian birr per month; while 97(11.6%) of the respondents had family history of mental illness (Table 1).

Table 1: Socio demographic characteristics of the respondents, University of Gondar, Northwest Ethiopia, April 2014 (n=836)

Variables	Frequency	Percent (%)
Age in years		
≤19	160	19.1
20-24	658	78.7
25+	18	2.2
Sex		
Male	538	64.4
Female	298	35.6
Residence		
Urban	544	65.1
Rural	292	34.9
Religion		
Orthodox Christian	618	73.9
Protestant	124	14.8
Muslim	78	9.3
Catholic	11	1.3
Other *	5	0.6
College/faculty/school		
Technology	270	32.3
Business and economics	130	15.5
Medicine and health sciences	101	12.1
Natural computational sciences	100	12.0
Social sciences and humanities	77	9.2
Law	76	9.1
Agriculture	30	3.6
Education	30	3.6
Veterinary medicine	22	2.6
Department choice		
Preferred	675	80.7
Not preferred	161	19.3
Year of enrollment		
1st	286	34.2
2nd	250	29.9
3rd	256	30.6
4th and above	44	5.3
Have boy/girl friend		
Yes	339	40.6
No	497	59.4

Other* stands for: 2 Jubbah witness, 1 waqefata and 2 no religion

Table 1: (Continued) Socio demographic characteristics of the respondents, University of Gondar, Northwest Ethiopia, April 2014 (n=836)

Variables	Frequency	Percent (%)
Have close friends		
Yes	296	35.4
No	540	64.6
Religious practice		
Always	223	26.7
Often	156	18.7
Sometimes	335	40.1
Never	122	14.6
Number of students per dorm		
<6	224	26.8
6-12	572	68.4
>12	40	4.8
Number of students per class		
<50	242	28.9
50-80	512	61.2
>80	82	9.8
Ever had conflict with friends		
Yes	467	55.9
No	369	44.1
Have pocket money		
Yes	521	62.3
No	315	37.7
Monthly amount of pocket money in birr (n=521)		
<150	86	16.5
150-300	221	42.4
301-450	70	13.5
>450	144	27.6
Have facial distress		
Yes	296	35.4
No	540	64.6
Family history of mental illness	97	11.6
Yes		
No	739	88.4

5.2. Prevalence of mental distress

Prevalence of mental distress among students was found to be 40.9% (95% CI 37.6, 44.1%). High prevalence of mental distress was reported in faculty of agriculture (63.3%) and comparatively low (34%) prevalence of mental distress was found in school of law students (Figure 3). Relatively high (44.6%) prevalence of mental distress was found among female students as compared to males (38.8%). The distribution of SRQ-20 showed a mean score of 6.53 (±4.14) ranging from 0 to 20.

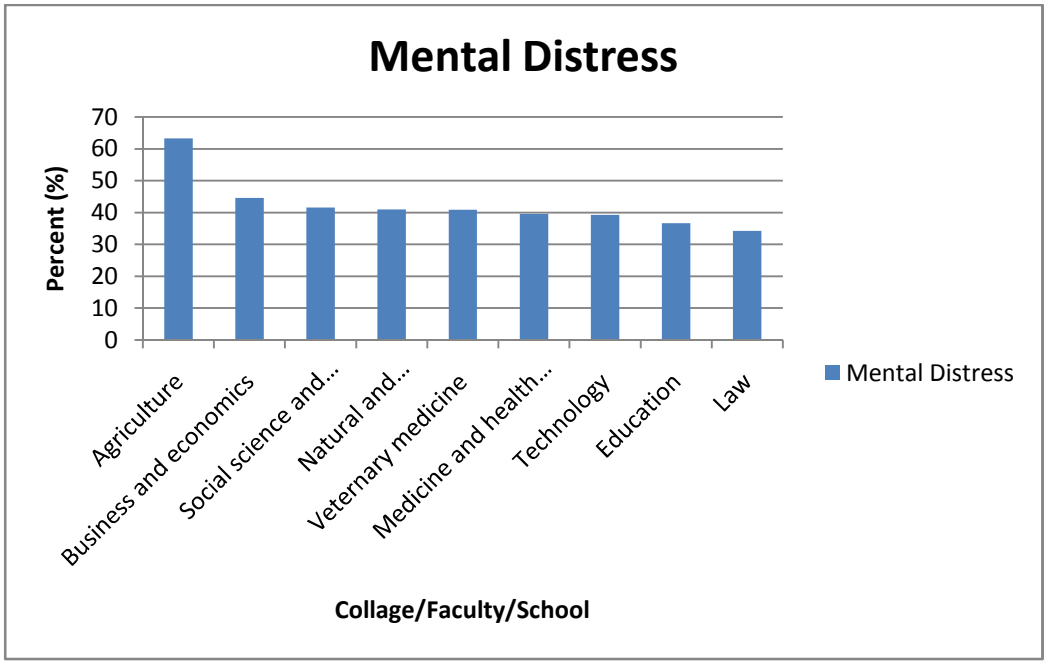

Figure 3: Prevalence of mental distress in students across the college/faculty/ School, University of Gondar, Northwest Ethiopia.

5.3. Factors associated with mental distress

In bivariate logistic regression analysis; department choice, interest towards the department, having close friends, religious practice, conflict with friends, absence of pocket money, having financial distress, family history of mental illness, ever use of Khat , current use of khat, ever use of other substances like shisha, current use of other substances like shisha, decrease grade than anticipated, missed many classes, anticipation of graduation, lack of vacation or break, and social support were associated significantly with mental distress .

However, in multivariate analysis; sex, interest towards the department, having close friends, religious practice, conflict with friends, absence of pocket money, having financial distress, family history of mental illness, ever use of Khat, decrease grade than anticipated, lack of vacation or break, and social support were yielded as significantly associated factors of mental distress among respondents (Table 2).

In this particular study, the likelihood of mental distress was higher among female students as compared to males. Female students were 1.65 times more likely to have mental distress than male (AOR=1.65; 95% CI 1.17-2.30). Similarly having interest towards the department was an important factor associated with mental distress. Students who were not interested with their field of study were 2.28 times more likely to develop mental distress as compared with those who were interested with their department (AOR=2.28; 95% CI 1.49-3.50).

Having close friend was found to be another important factor associated with mental distress. Students who have no close friends were 1.48 times more likely to have mental distress than their counter parts (AOR=1.48; 95% CI 1.03-2.14).

The odds of mental distress by respondents who had family history of mental illness were 2.12 times higher as compared with those who have not (AOR=2.12; 95% CI 1.31-3.45).

Having pocket money was also among significant factors. Students who do not have pocket money were 1.53 times more likely to develop mental distress than who have pocket money (AOR=1.53; 95% CI 1.09-2.14). Moreover, students who have financial distress were 1.49 (AOR= 95% CI 1.05- 2.10) times more likely to have mental distress as compared to those who do not have financial distress.

Furthermore, students who ever had conflict with their room mates were 1.93 times more likely to have mental distress than those who do not (AOR=1.93; 95% CI 1.41-2.65)

Among behavioral factors, khat use was significantly associated with mental distress. Students who ever use khat were 1.71 times more likely to have mental distress as compared to students who never use khat (AOR=1.71; 95% CI 1.12-2.59) (Table 2).

Academic factors were found to be other factors associated with mental distress. Students whose grades were lower than anticipated were 2.07 times more likely to have mental distress than their counter parts (AOR=2.07; 95% CI 1.51-2.83). Similarly those students who perceived there is lack of academic vacation or break were 1.46 times more likely to have mental distress (AOR=1.46; 95% CI 1.06-2.02).

The current study revealed that social support is important predictor of mental distress. Students with low social support were 2.5 times more likely to have mental distress as compared to those students with high social support (AOR=2.58; 95% CI 1.58-4.22) (Table 2).

Table 2: Bivariate and multivariate logistic regression analysis of factors associated with mental distress among students, University of Gondar, Northwest Ethiopia, April 2014. (n=836)

Variables	Mental distress		OR with 95% CI		P-value
	Yes	No	Crude	Adjusted	
Sex					
Male	209	329	1	1	
Female	133	165	1.26 (0.95-1.69)	1.65 (1.17, 2.30)*	0.003
Department choice					
Preferred	264	411	1	1	
Not preferred	78	83	1.46 (1.04, 2.07)	1.13 (0.70, 1.83)	0.612
Interest to department					
Yes	268	438	1	1	
No	74	56	2.16 (1.48, 3.15)	2.28(1.49, 3.50)*	<0.001
Having close friends					
Yes	248	410	1	1	
No	94	84	1.85 (1.33, 2.56)	1.48 (1.03, 2.14)*	0.036
Religious practice					
Yes	281	433	1	1	
No	61	61	1.54 (1.05, 2.26)	1.58 (1.02, 2.46)*	0.04
Ever had conflict					
Yes	226	241	2.04 (1.54, 2.72)	1.93 (1.41, 2.65)*	<0.001
No	116	253	1	1	
Pocket money					
Yes	189	332	1	1	
No	153	162	1.65 (1.24, 2.21)	1.53 (1.09, 2.14)*	0.013
Having financial distress					
Yes	154	142	2.03 (1.52, 2.71)	1.49(1.05, 2.10)*	0.023
No	188	352	1	1	
Family history of mental illness					
Yes	60	37	2.62 (1.70, 4.06)	2.12 (1.31, 3.45)*	0.002
No	282	457	1	1	
Ever use of Khat					
Yes	81	69	1.91 (1.34, 2.73)	1.71(1.12, 2.59)*	0.012
No	261	425	1	1	
Current use of Khat					
Yes	63	51	1.96 (1.32, 2.92)	1.13 (0.59, 2.19)	0.697
No	279	443	1	1	

*= Statistically significant at P<0.05

Table (continued): Bivariate and multivariate logistic regression analysis of factors associated with mental distress among students , University of Gondar, Northwest Ethiopia, April 2014 (n=836)

Variables	Mental distress		OR with 95% CI		P – value
	Yes	No	Crude	Adjusted	
Ever use of other substances like shisha					
Yes	25	18	2.08 (1.12, 3.88)	2.01(0.96, 4.21)	0.062
No	317	476	1	1	
Current use of other substances like shisha					
Yes	22	17	1.92 (1.23, 4.32)	1.33 (0.47,3.70)	0.583
No	320	477	1	1	
Decrease grade than anticipated					
Yes	205	194	2.31 (1.71, 3.06)	2.07(1.51,2.83)*	<0.001
No	137	300	1	1	
Missed many class					
Yes	54	44	1.92 (1.25, 2.93)	1.46 (0.91, 2.38)	0.12
No	288	450	1	1	
Anticipation of graduation					
Yes	186	221	1.47 (1.12, 1.94)	1.21 (0.87,1.67)	0.243
No	156	273	1	1	
Lack of vacation					
Yes	156	161	1.74 (1.31, 2.31)	1.46(1.06, 2.02)*	0.019
No	186	333	1	1	
Social support					
Low	152	170	3.10 (1.97, 4.86)	2.58(1.58, 4.22)*	<0.001
Moderate	158	212	2.58 (1.65, 4.03)	2.50(1.54, 4.04)*	<0.001
High	32	111	1	1	

*= Statistically significant at P<0.05

6. Discussion

The prevalence of mental distress among students was found to be 40.9% in the current study. This finding is lower as compared to studies in Australia (53%) [24] USA (57%) [23], and Brazil (44.7%) [31]. The difference could be attributed to the socio, cultural and environmental factors. It was also lower when compared with study in Hawassa University, Ethiopia 49.1% [35].This might be due to time variation; the improvement of infrastructure and a service option provided by school authorities from time to time.

However, the prevalence in the current study was higher when compared with studies in France (25.7%) [32] , Norway (22.9%) [33] , Iceland (22.5%) [28] and Australia (19.2%) [13]. Moreover, the prevalence was higher as compared to studies in Africa i.e. South Africa (27%) [9], Uganda (16.2%)[34], Kenya 10.8% [26]. This could be due to the different instrument used in other studies or it could be a real difference. However, nearly similar prevalence was reported in Malaysia's study (41.9%) [25].

The prevalence of mental distress in this study was higher among female students as compared to their male counterparts. The finding is consistent with other studies in Australia [12, 13], France [17], Norway [33] and Turkey [36]. The affective nature of their response to stressors, domestic violence, and hormonal changes during menstruation could be the possible causes for the higher prevalence of mental distress among female students [48].

Although, the current study does not show any significant association between year of study and mental distress, other studies done in Australia [13], Saudi Arabia [49], Norway [33] and Ethiopia (Hawassa) [35] identified that freshman (first year) students were more likely to have mental distress than second year and above. This may be due to the fact that, first year students face difficulty in adapting to University education.

Having interest towards the field of study was an important factor of mental distress. Students who are not interested with their department were two times more likely to develop mental distress as compared with those who are

interested. A study among students in Adama University also came up with the same finding [27].

Moreover, family history of mental illness was strongly associated with mental distress. Students who had family history of mental illness were more likely to have mental distress as compared with that who have not; which is in line with study in Adama, Ethiopia [27]. This could be explained by genetic predisposition and living conditions within the families. Moreover, caring for the mentally ill family member may also be an additional stress that contributes to a higher prevalence of mental distress [9].

The study revealed that financial distress was significantly associated with mental distress. Those students who have financial distress and have no pocket money were more likely to experience mental distress. This finding is supported by other studies in Australia [13], United States of America [39] and Nigeria [40] which found that financial hardship was independently associated with mental distress. The rising cost of stationary materials and photocopy services may crate stressful situation in students. Moreover, students with financial difficulty experience anxiety, frustration, and sense of haplessness and trouble of sleeping which may further lead students mentally distressed [50]. However, in this study; there was no significant association between low amount pocket money and mental distress in students.

The study also found that mental distress was significantly associated with religious practice. Students who were involved in religious program, irrespective of their religion, were less likely to be mentally distressed. This finding is supported by the other studies done in Ethiopia [27, 35]. This could be due to the fact that religious teaching helps in stress management. Furthermore, it facilitates the development of adaptive behaviors [51, 52].

On the other hand, students who ever had conflict with their room mates were mentally distressed. This finding is consistent with a study in Adama University [27]. This might be due to the fact that, campus life where students live together in a group; conflicts may break social ties and might result in a stressful situation.

In addition, ever use of khat was found to be a significant factor of mental distress. Students who ever use khat were 1.7 times more likely to have mental distress as compared to students who never use khat. This finding is in line with other studies in Ethiopia [27, 38] and Sao Paulo, Southeastern Brazil [31]. This may be due to the fact that substance use leads to inefficiency in life function, impaired relationship and sleep difficulty. Furthermore, substance use is associated with increased absenteeism from class and poor cadmic performance which can further lead to mental distress in students [53]. However, since the study is a cross-sectional, it is difficult to ascertain the direction of causality.

Academic factors were found to be other factors associated with mental distress. Students whose grade was lower than anticipated were two times more likely to have mental distress than their counter parts. However, the present study did not show any association between mental distress and academic performance.

In this study, social support was also found to be another determinant factor for mental distress in students. Having high level of social support from significant others were negatively associated with mental distress. In this study, students with low social support were more than two times more likely to have mental distress as compared to those students with high social support. This finding is also supported with other studies [31, 34, 41]. The possible explanation could be; social support may moderate genetic and environmental vulnerabilities and confer resilience to stress, possibly via its effects on the hypothalamic pituitary-adrenocortical (HPA) system, the noradrenergic system, and central oxytocin pathways. Furthermore, social support is exceptionally important for maintaining good physical and mental health [54].

7. Limitation and strength of the study

7.1. Limitation of the study

This study has some important limitations that should be kept in mind when interpreting the results. First, the cross-sectional nature of the study design does not confirm definitive cause and effect relationship. Furthermore, the study was based on self-reported information provided by students. Therefore, there is some potential for reporting bias which may have occurred because of the respondents' interpretation of the questions or desire to report their emotions in a certain way or simply because of inaccuracies of responses. Finally; reports for some of the questions were past history or encounters which are prone to recall bias.

7.2. Strength of the study

Despite these limitations, the study uses self reporting questionnaire (SRQ-20) as a study tool, which is a worldwide accepted, standardized questionnaire and validated in Ethiopia to measure mental distress.

8. Conclusion

The prevalence of mental distress among students was found to be high. The prevalence of mental distress was relatively high among female students.

Being female sex , lack of interest towards the field of study, not having close friends, never attend religious programs, conflict with friends, absence of pocket money, having financial distress, family history of mental illness, ever use of Khat, lower grade than anticipated, lack of vacation or break, and low to moderate social support were factors associated with mental distress.

9. Recommendations

To policy makers

- Enlightening mental health policy and legislation and training of professionals to control mental illness at the early stage are needed.

To Ministry of health

- The results highlight that the University students are at risk population for mental health problems and suggest the need for campus based health approach to the prevention and treatment of mental health problems in students.

To University of Gondar

- As the study findings showed a high level of mental distress among female students, supporting them and taking care of this group by student support system is recommended.
- In addition, establishment of advisory mechanism to regulate and monitor student's school performance within the University campus is mandatory.
- The study highlights there is significant association between substance use and mental distress. Therefore, strengthening or establishing positive affirmative action to protect students who are at risk of substance abuse especially khat use is recommended.
- In terms of mental distress prevention; University students need to be oriented about ways of overcoming trouble of finding new friends, fight with friends, decrease grade than anticipated and lack of academic vacation or break.
- The University needs to identify students who have financial distress and providing necessary support like stationary materials and photocopy services.
- The University needs to establish online support services and health education programs in improving mental health services in students since social support is significantly associated with mental distress.

- Furthermore, establishment of IEC programs about the factors associated with common mental disorders which will create awareness in the students is mandatory.

To students

- Students better involved in the religious teaching and advised to have close friends and keep away from use of substances like khat.

To the community at large

- There is a need to strengthen emotional and social support at the community and family level which protect students from mental distress.

To researchers

- Further longitudinal research is recommended to establish causal pathway and to gain an accurate picture of the course of mental distress throughout the course of study.

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Annex 1: Participant information sheet

Title of the study: Prevalence of Mental distress and associated factors among undergraduate students of University of Gondar; Northwest Ethiopia.

Objectives of the study: to assess prevalence of Mental distress and associated factors among undergraduate students of University of Gondar; Northwest Ethiopia.

Principal investigator: Berihun Assefa (BSc, MSc)

Advisors: Telake Azale (Ass.Professor), and Resom Berhe (BSc, MPH)

Introduction

Dear participants my name is _____ and I am working as a facilitator in this study. The study is proposed to assess the Prevalence of Mental distress and associated factors among undergraduate students of university of Gondar; Northwest Ethiopia. The results of this study may help to understand the burden of mental health problems in students and to guide interventions that decrease risk as well as to improve student's psychological wellbeing.

- **Information about the study**

Your part in the study

Your role in this study is as a study participant. The choice is made randomly by computer generated random number. It is entirely your choice whether to participate in this study or not. Therefore, you can decide freely based on the information that we gave you. Moreover, we would like to inform you that involved and uninvolved student will be treated equally. When you agree to participate in this study, you will be asked on some socio-demographic related questions, mental distress related, behavioral factors, and academic related questions. It will take about 30 minutes to answer the questions.

- **Possible risks and benefits**

There is no direct benefit that you will get from this study right now. Similarly, there is no incentive for those who participated in the study. However, the results of this study will benefit you and other students in the future by identifying factors associated with mental distress in students. Moreover, policy makers and other concerned bodies will take the recommendations to develop policy for

prevention, early diagnosis and treatment of common mental illness in students. With regard to risks, there is no risk which is attached to this study and only grouped data will be reported.

- **Confidentiality**

We strongly believe that your confidentiality must be protected. Therefore, there is no need of writing your name or ID number on the format. Moreover, we will never tell anyone else any piece of information about your response. Although the facilitator, investigator and supervisor may look at the filled questionnaire, you will be identified only by code number. All study documents will be kept in a locked cabinet by the investigator until the study is being completed and will be completely destroyed at the end of the study.

- **Voluntariness of the study**

The study is in voluntarily basis as described above. As a result, there is no penalty for someone who decided not to be included in the study. Furthermore, it is your right to withdraw from study participation at any time, for any reason.

- **Right as a participant**

It is your full right to ask the principal investigator or any relevant body any question or clarification about the study at any time by any means. Therefore, you will be provided with the contact information of the investigator and relevant others on a separate sheet of paper. Moreover, you have the right to stop filling the questionnaire at any time. Of course, you have also the right to skip any question that you don't like to answer. However, your honest participation will have significant contribution to generate valid information that can be used for intervention designs. If there is anything that require clarification please don't hesitate to ask the felicitator for clarification.

Contact address

Principal investigator: Berihun Assefa

Mobile phone: +251-911542348, **Email**: berihunassefa21@gmail.com; **Po. Box**: 196

Thank you!

Annex 2: Consent form

Hello! My name is …….. I am here on behalf of Berihun Assefa, student of the institute of Public Health in the University of Gondar.

He is conducting a research for the partial fulfillment of second degree on "***Prevalence of mental distress and associated factors among undergraduate students of University of Gondar, Northwest Ethiopia***". He has received permission from Institute of Public health at University of Gondar to conduct this study.

The objective of this study is to assess prevalence of mental distress and associated factors among University of Gondar undergraduate students; Northwest Ethiopia. You are selected to participate in the study. The choice is made randomly by computer generated random number. The information you give us is confidential and will be used only for study purpose .A code number will identify every participant and no names will be used. If a report of the result is published, only summarized information of the total group will appear. Participation in the study is voluntary; you have the right to participate, or not to participate or refuse at any time. Similarly, there is no incentive for those who participated in the study. However, the results of this study will benefit you and other students in the future by identifying factors associated with mental distress in students. If there are things that require clarification please don't hesitate to ask the facilitators for clarification.

Do you wish to participate in the study?

1) Yes, I want to participate
2) No, I don't want to participate

Having been well explained and informed of the intentions and benefits of the study, I voluntarily consent to participate in the study,

_____ _____

Sign Date

Annex 3: Questionnaire

Part I. Socio-demographic characteristics of the respondents

This part of the questionnaire assess about your socio economic and demographic information's, after reading the following the questions please give appropriate answer concerning your socio economic and demographic information.

No	Questions	Response/Options	Remark
101	Age in years	_____	
102	sex	1. Male 2. Female	
103	Residence	1. Urban 2. Rural	
104	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Other_____	
105	From which college/ Faculty /school are you?	1. Medicine and Health sciences 2. Business and Economics 3. Natural and Computational Sciences 4. Social science and Humanities 5. Veterinary Medicine, 6. Agriculture 7. Technology 8. Education 9. Law	
106	Department choice	1. Preferred 2. Not preferred	
107	Year of enrollment	1. 1st year 2. 2nd year 3. 3rd year 4. 4th year 5. 5th year 6. 6th year	

108	Are you interested with your department	1. Yes 2. No	
109	Do you have boy or girl friend	1. Yes 2. No	
110	Do you have close friends	1. Yes 2. No	
111	Do you take part in religious practice	1. Always 2. Often 3. Some times 4. Never	
112	How many students are there in your dormitory?	1. <6 2. 6-12 3. >12	
113	How many students are there in your class room?	1. <50 2. 50-80 3. >80	
114	Do you face conflict with your friends in the dormitories/class rooms	1. Always 2. Often 3. Some times 4. Never	
115	Do you have pocket money?	1. Yes 2. No	
116	If yes for question no 115, what is your monthly amount of pocket money in birr	_____	
117	Do you have financial distress/problem for stationary (like photocopy) and recreational activity	1. Yes 2. No	
118	Is there any family history of mental illness	1. Yes 2. No	

Part II: Self-Reporting Questionnaire (SRQ)

The following questions are related to certain pains and problems that may have bothered you in the last **30 days**. Please tick the **'Yes'** box if you have had this symptom in the last 30 days. On the other hand, if you have not experienced this symptom in the last 30 days please tick the **'No'** box.

Please tick the **'Yes'** box if you have had this symptom in the **last 30 days** and tick the **'No'** box if you had not**.**			
201	Do you often have headaches?	☐ No	☐ Yes
202	Is your appetite poor?	☐ No	☐ Yes
203	Do you sleep badly?	☐ No	☐ Yes
204	A re you easily frightened?	☐ No	☐ Yes
205	Do your hands shake?	☐ No	☐ Yes
206	Do you feel nervous?	☐ No	☐ Yes
207	I s your digestion poor?	☐ No	☐ Yes
208	Do you have trouble thinking clearly?	☐ No	☐ Yes
209	Do you feel unhappy?	☐ No	☐ Yes
210	Do you cry more than usual? N o Yes	☐ No	☐ Yes
211	Do you find it difficult to enjoy your daily activities?	☐ No	☐ Yes
212	Do you find it difficult to make decisions?	☐ No	☐ Yes
213	I s your daily work suffering?	☐ No	☐ Yes
214	A re you unable to play a useful part in life?	☐ No	☐ Yes
215	Have you lost interest in things?	☐ No	☐ Yes
216	Do you feel that you are a worthless person?	☐ No	☐ Yes
217	Has the thought of ending your life been on your mind?	☐ No	☐ Yes
218	Do you feel tired all the time?	☐ No	☐ Yes
219	Do you have uncomfortable feelings in the stomach?	☐ No	☐ Yes
220	A re you easily tired?	☐ No	☐ Yes

PART III: Substance use

The following questions focuses on Khat chewing practices, Alcohol drinking, Cigarette smoking and other substances like Hashish and sedatives use. So you are kindly requested to give a genuine answer about your personal behavior on the use of these substances.

Please tick the **'Yes'** box if you have had use and **'No'** box if you don't use the mentioned substance in your life time or in the last 1 month as directed.			
301	Have you ever used khat in your life?	☐ No	☐ Yes
302	Have you used Khat in the last 1 month?	☐ No	☐ Yes
303	Have you ever used alcohol drinks (like Arekie, Tela Tej beer, or any other alcohol drinks) in your life time	☐ No	☐ Yes
304	Have you used any kind of alcohol drinks in the last 1 month?	☐ No	☐ Yes
305	Have you ever used Tobacco products such as cigarette smoking, shisha any other tobacco products in your life time?	☐ No	☐ Yes
306	Have you used any kind of tobacco product in the last 1 month?	☐ No	☐ Yes
307	Have you ever used other substances / Such as hashish, Pat, Kaya, Joyint, Cannabis, Ganja, and or Heroin and others.	☐ No	☐ Yes
308	Have you used any other substances / Such as hashish, Pat, Kaya, Joyint, Cannabis, Ganja, and or Heroin and others in the last 1 month?	☐ No	☐ Yes

Part IV. Academic factors

This part assess about academic factors that students face/experience in the academic year. For the first six items (401-406) the answer is provided by **"Yes"** or **"No".** For the last question (407) please write your last semester (if your academic year is semester based) or last year cumulative grade on the space provided.

Please tick the **'Yes'** box if you have experienced and **'No'** box if you don't in the last academic year.			
401	Increase class work load	☐ No	☐ Yes
402	Decrease grade than anticipated	☐ No	☐ Yes
403	Missed too many class	☐ No	☐ Yes
404	Anticipation of graduation	☐ No	☐ Yes
405	Serious arguments with instructors	☐ No	☐ Yes
406	Lack of vacations /break	☐ No	☐ Yes
407	What is your last semester/ year cumulative grade (CGPA)		

Part V: Social Support

This part assess about social support that you have got from your family, friends and significant others. Each item is scored from 1(very strongly disagree to 7 (very strongly agree). Read each statement carefully and indicate how you feel about each stamen.

Very strongly disagree (1), Strongly disagree(2), Mildly disagree (3), Neutral(4), Mildly agree (5), strongly agree (6), Very strongly agree (7)								
501	There is a special person who is around when I am in need	**1**	**2**	**3**	**4**	**5**	**6**	**7**
502	There is a special person with whom I can share my joys and sorrows	**1**	**2**	**3**	**4**	**5**	**6**	**7**
503	My family really tries to help me	**1**	**2**	**3**	**4**	**5**	**6**	**7**
504	I get emotional help and support I need from my family	**1**	**2**	**3**	**4**	**5**	**6**	**7**
505	I have a special person who is a real source of comfort to me	**1**	**2**	**3**	**4**	**5**	**6**	**7**
506	My friends really try to help me	**1**	**2**	**3**	**4**	**5**	**6**	**7**
507	I can count on my friends when things go wrong	**1**	**2**	**3**	**4**	**5**	**6**	**7**
508	I can talk about my problems with my family	**1**	**2**	**3**	**4**	**5**	**6**	**7**
509	I have friends with whom I can share my joys and sorrows	**1**	**2**	**3**	**4**	**5**	**6**	**7**
510	There is a special person in my life who cares about my feelings	**1**	**2**	**3**	**4**	**5**	**6**	**7**
511	My family is willing to help me make decisions	**1**	**2**	**3**	**4**	**5**	**6**	**7**
512	I can talk about my problems with my friends	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Thank you very much!

Annex 4: Declaration of investigator

I, the undersigned, MPH student declare that this research project is my original work in partial fulfillment of the requirement for the degree of Master of Public Health. I agree to accept the responsibility for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the research and institutional review board of the University of Gondar, Institute of public health.

Name of the student: Berihun Assefa

Date _____**Signature:** _____

Place of submission: Institute of public Health, College of Medicine and Health Sciences, University of Gondar.

Approval of advisors

This thesis work has been submitted with my/ our approval as University advisor(s).

Advisors

	Name	Date	Signature
1.	Mr. Telake Azale (Ass. Proffesor)	_____	_____
2.	Mr. Resom Berhe (BSc, MPH)	_____	_____